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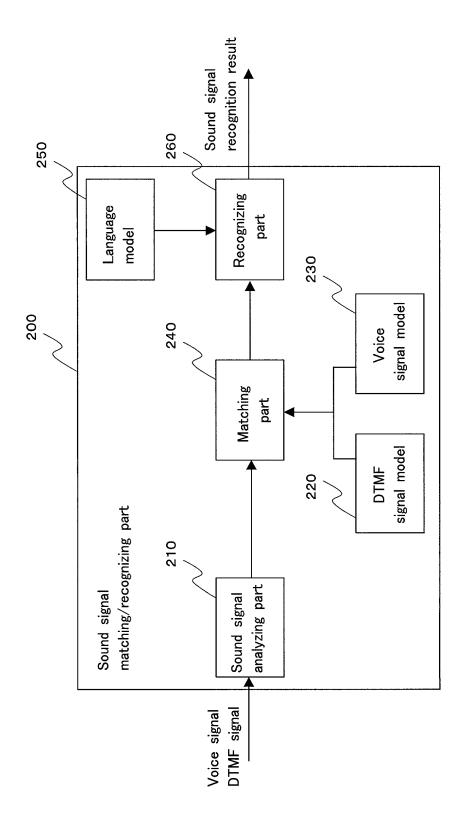


Fig. 2

Word ID	Notation	Reading (Speech)
-	0	"Zero"
2	0	"Null"
8	0	DTMF-0
4		"One"
2	1	DTMF-1
9	2	"Two"
	2	DTMF-2
•••		
35	YES	"Yes"
36	YES	DTMF"*"
37	NO	"No"
38	NO	DTMF-#
	:	Ē

Fig. 3

Word ID	Notation	Reading (Speech)
-	0	"Zero"
-	0	"Nail"
-	0	DTMF-0
2		"One"
2	-	DTMF-1
8	2	"Two"
ಣ	2	DTMF-2
•••	•••	÷
4	YES	"Yes"
4	YES	DTMF-"*"
5	NO	"No"
ខ	NO	DTMF-#
•	:	:

Fig. 4

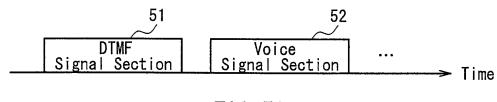


FIG. 5A

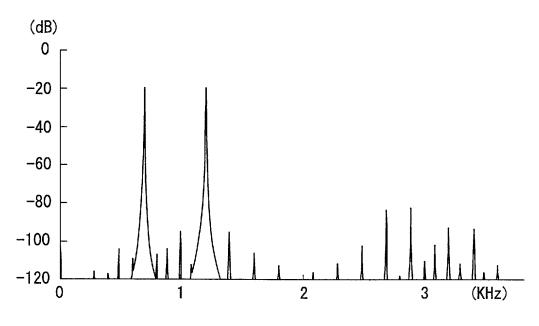


FIG. 5B

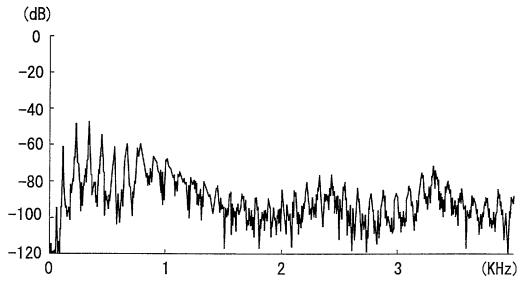
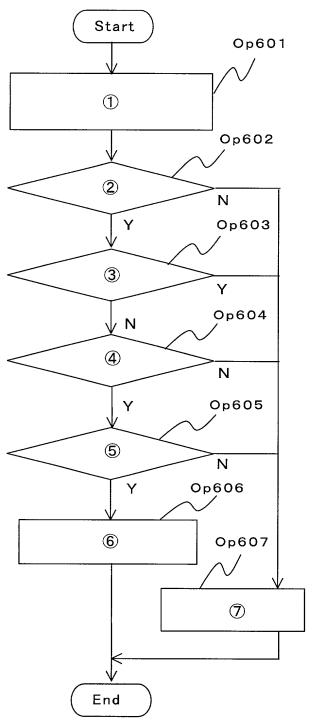


FIG. 5C



- 1 The matching part 240 detects two peak frequencies f1 and f2 from the wave form spectrum of an input signal
- ② Is there any corresponding frequency in the DTMF frequency table
- ③ Is a level difference between the detected two peak frequencies a predetermined threshold value or higher?
- (4) Is a level difference (L1-L3) between the detected two peak frequencies a preditermined threshold value or higher?
- 5 Is a difference (L1-L4) between an average value L4 of the level in a frequency portion other than the frequency ranges of $f1\pm\alpha$ and $f2\pm\alpha$ and the level value L1 of f1 a threshold value or higher?
- 6 A sound signal is recognized based on the DTMF frequency table
- The matching part 240 outputs the score "0" as a result of matching process with reference to the DTMF signal model 220

Fig. 6

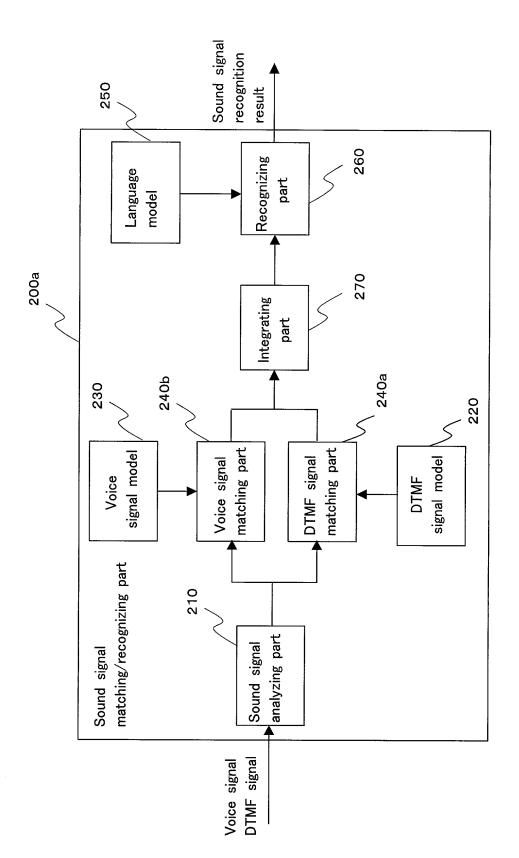


Fig. 7

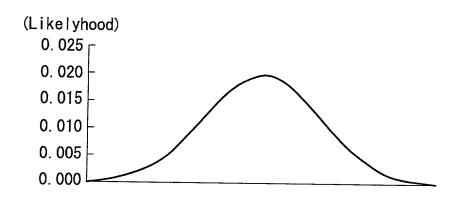


FIG. 8

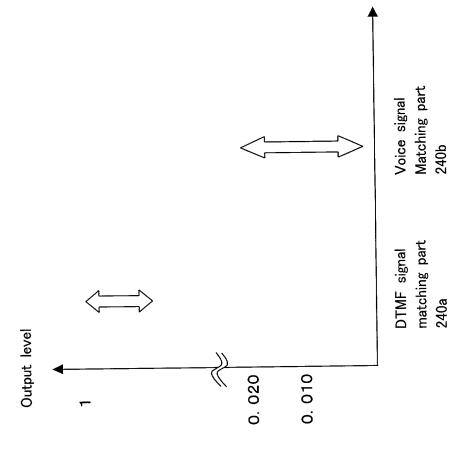


Fig. 9

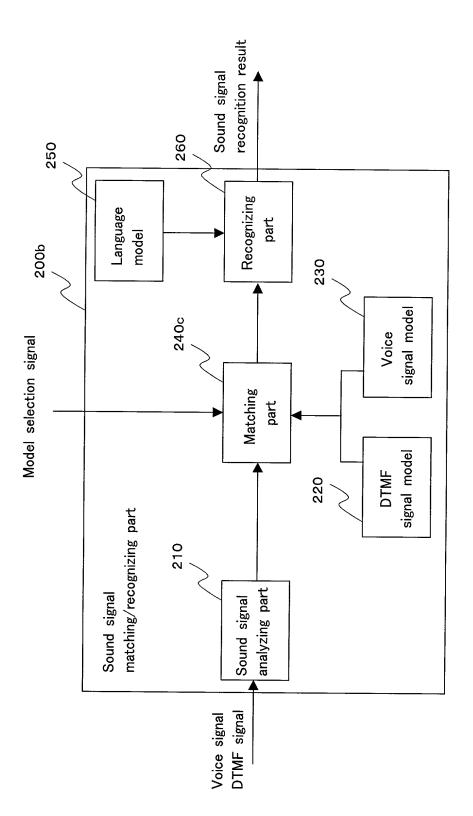


Fig. 10

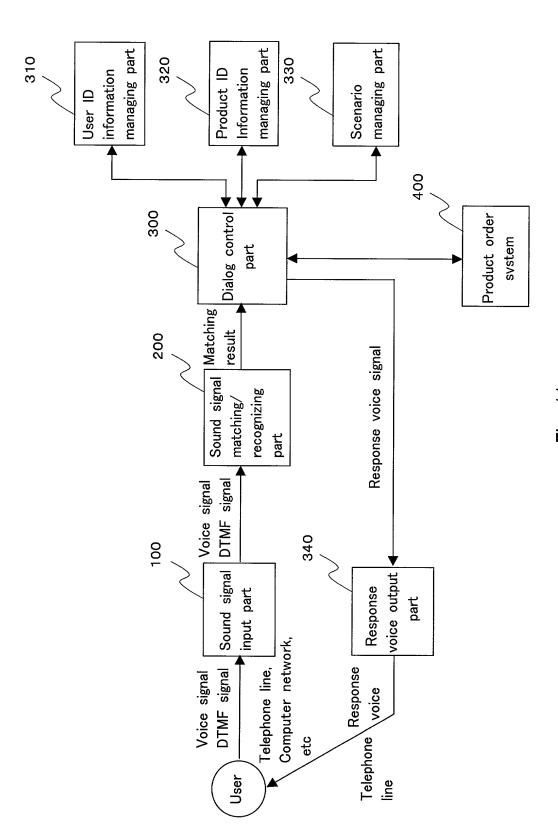


Fig. 11

Dialog Example: (U: User input, S: Response from a dialog system)

S1:Thank you very much for joining us.

S2:User ID, please.

U1:"1212" ("1212" is inputted by tough tone)

S3:Your name, please.

U2:Washio

S4:You are Mr. Washio of User ID 1212? Desired product, please.

U3:1 would like one piece of Product No. "3821" ("3821" is inputted by tough tone).

S5:One car wax of product No. 3821.

U4:"YES"(button "*" is pressed and "YES" is inputted by tough tone)

S6:Your address, please

U5:Kawasaki city Nakahara "4"_"1" ("4" and "1" are inputted by tough tone

S6: Kawasaki city Nakahara 4-1? Your order is accepted

S7: Thank. Please join us again

Fig. 12

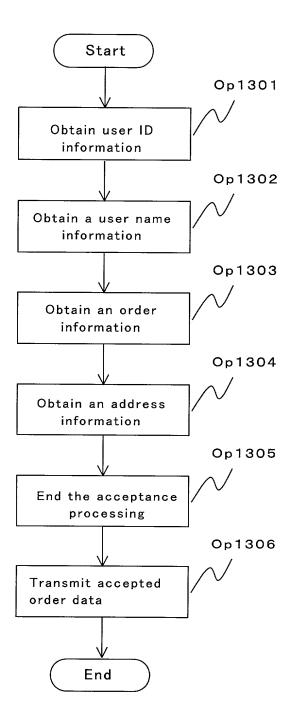


Fig. 13

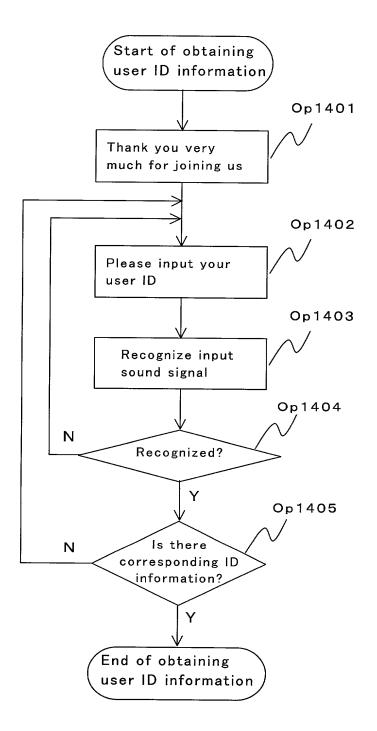
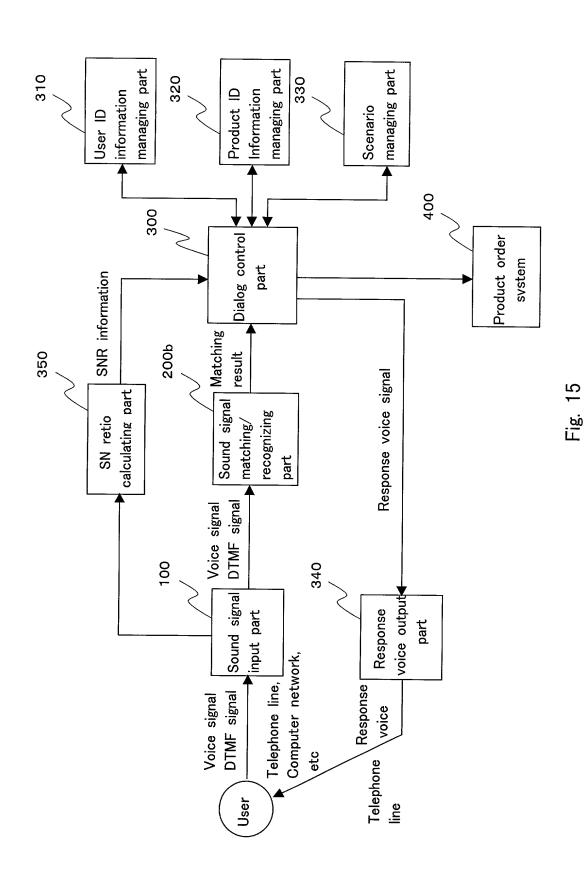
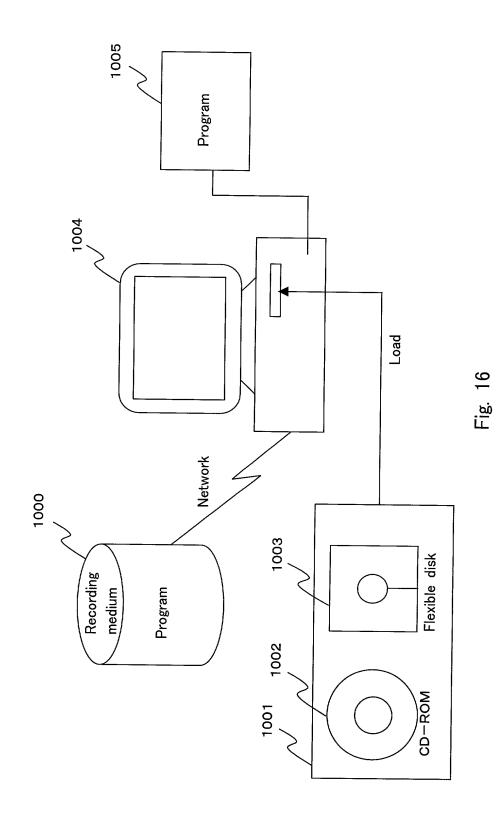


Fig. 14





1633	⋖	m	O	Q
1477	ဇ	9	0	#
1336	2	വ	ω	0
1209	-	4	7	*
Frequency [Hz]	697	770	852	941

(PRIOR ART)

Fig. 17

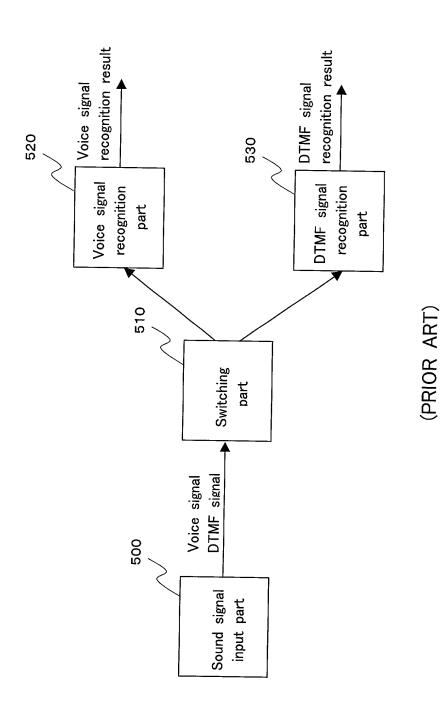


Fig. 18